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Short Guide to Reviewing Interdisciplinary Research Proposals

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Building a cadre of interdisciplinary reviewers

The intellectual conservatism of research funders and the academic community may err towards “a safe pair of hands” when allocating research funds. This risk-averse approach can hinder the ability of interdisciplinary research projects to secure funding.

Interdisciplinary researchers often lack a fixed peer community and interdisciplinary teams and researchers who are not well known to referees may be disadvantaged by the review process. Referee choice is less problematic in well-established interdisciplinary areas such as science and technology studies where there is already a pool of known, interdisciplinary referees. The problem is more acute for proposals that are trying to put forward a novel interdisciplinary project where there may not be a recognised set of other academics who are individually qualified to referee it.

This note seeks to foster a stronger interdisciplinary culture whereby researchers and, in particular, reviewers are encouraged to think more deeply about a project, the benefits of an interdisciplinary approach, the appropriate disciplines to involve, the extent of integration required and how this integration will be achieved. It is primarily aimed at individual project referees but also contains advice relevant to organisations who commission and fund interdisciplinary research and to the review panels that they may convene to conduct this process. In part, given the problems of identifying appropriate referees for interdisciplinary applications, there is potentially a greater role for such panel members in assessing referees’ comments on interdisciplinary proposals and in considering the quality of interdisciplinary integration.

Particularly with funding bodies’ increasing emphasis on research impacts, there are also some relevant messages for post-award evaluations of individual grants, programmes, and research centres as we attempt to capture and share learning about good practice in interdisciplinary assessment although a future briefing note will treat this topic in more detail.

Different approaches to interdisciplinarity

In the first briefing note in this series we defined interdisciplinary research as occurring where the contributions of the various disciplines are integrated to provide holistic or systemic outcomes¹. We described how interdisciplinary research can be; **within** the social sciences; **between** the social, natural and life sciences (or indeed *within* the natural and life sciences). We have identified two models of interdisciplinary research that are appropriate to different types of research question and will require differing combinations of expertise in researchers². Reviewers will therefore need to consider:

- the extent to which the project is interdisciplinary with the aim of furthering the expertise and competence of academic disciplines themselves, for example through developments in methodology which enable new issues to be addressed or even new disciplines or sub-disciplines to be formed (for example, bioinformatics, medical sociology). We would term this “academically-oriented interdisciplinary research”
- the extent to which the project is interdisciplinary in order to address issues of social, technical and/or policy relevance where the primary aim is problem-oriented and discipline-related outputs are less central to the project design. We would term this “problem-focused interdisciplinary research”

The criteria for the choice of disciplines to be involved in a project will differ in each of these cases but it is generally easier for proposals that adopt the former approach to be evaluated by discipline-based specialists.

Implications for research design

A good interdisciplinary proposal should be goal-oriented and demonstrate synergies between methods and disciplines. More so than a mono-disciplinary project, interdisciplinary projects may need to develop and change as they proceed. The proposal should therefore be set out in broad steps but with a flexible timetable that recognises that the ordering might change: while the end goal should be clear, the routes to achieving it might be subject to revision as the project progresses.

This means that the research team also needs to be more reflective, and the approach more reflexive, than is required for a mono-disciplinary project. The applicant should be sufficiently aware of this and build in a series of decision points to review project direction and allow for refocusing as necessary.

Given the need for greater flexibility in interdisciplinary proposals, where and how should applicants draw the boundaries? Much more than discipline-based projects, interdisciplinary projects have to undergo a **preliminary research phase** that is open-ended. This is particularly true for “problem-focused” interdisciplinary projects, compared with more academically-oriented interdisciplinary research where it is probably clearer from the outset which disciplines need to collaborate to give the required interdisciplinary outcomes.

This initial phase involves trying out a range of possible boundaries to the problem to see which gives the best ‘fit’, allowing the outputs of this analysis to determine the disciplines to be involved. This should be part of the process of developing a research proposal and it should be clear from the proposal (i) what has been done prior to submitting the bid and (ii)

¹ *Short Guide to Developing Interdisciplinary Research Proposals*, ISSTI Briefing Note No. 1, March 2007, www.issti.ed.ac.uk/documents.php?item=18.

² Bruce, A., Lyall, C., Tait, J. and Williams, R. (2004), “Interdisciplinary Integration in the Fifth Framework Programme”, *Futures*, 36/4, pp. 457-470.

that the outcome described in the bid represents a justifiable decision on the project's boundaries.

The outcome of the initial exploratory phase should be:

- a specification of the range of issues that are central to the research problem
- a description of how they interact with one another to create or sustain the problem
- a (general) plan for how these interactions can be modified to deliver an implementable, synergistic solution

The early, open-ended phase at the start of a new project may therefore be quite lengthy and complex. This can lead reviewers to question the clarity of the project specification which does need to be firm enough to justify the selection of team members and their relevant experience. Thus, research evaluators need to be able to judge the quality and effectiveness with which this process is likely to take place and so need to understand it themselves.

So called problem-focused interdisciplinary proposals may be driven by public or commercial needs. In this case the initial problem is unlikely to be expressed in terms of disciplines and their limitations. Such problems do not have clear discipline labels attached to their various components and it may be more important to understand the interactions among the components than the details of the components themselves. An **active strategy** is thus needed to provide for integration among the different disciplines and different models in an interdisciplinary project. This orchestration task is crucial to the success of a project and to the delivery of synergistic outcomes.

This point should not be taken to imply that the quality of discipline-based research is less important in an interdisciplinary research project. It merely emphasises that any single project is unlikely to deliver discipline-related breakthroughs as well as the other synergistic benefits of integrating disciplines. To expect to find both in a single proposal is to make unrealistic demands on the proposers.

Practical considerations for reviewers

Interdisciplinary research does not occur automatically by bringing together several disciplines in a research project. Extra effort is needed to promote the formation of a cohesive research team involving researchers from different disciplines, to combine expertise from several knowledge domains and to overcome communication problems among researchers from different disciplines. This means that interdisciplinary projects tend to be slightly larger, more expensive, and may take longer to deliver high quality publications. In practical terms this might also mean more travel to liaise with project team members on a more frequent basis and attendance at a greater number of more diverse conferences in order to reach all potential audiences.

Given that successful, interdisciplinary research is more resource intensive than mono-disciplinary research, reviewers therefore need to recognise that effective interdisciplinary integration takes time and that this can have an impact on the perceived value for money of projects.

Other issues that the reviewer should be aware of are that:

- the applicants may be based in non-traditional departments
- the proposed publication outputs may not be the top-ranking, discipline-based journals
- the proposed research may not be at the cutting-edge of any single discipline

but none of these factors automatically implies that it is not a high-quality proposal.

The grant proposals themselves may need to be longer in order to allow additional space to justify the interdisciplinary research design and this has implications when proposals have to be submitted using the UK Research Councils' joint electronic submission system. It might even be useful for the Councils to append an extra section specifically for interdisciplinary bids, in which applicants could describe the distinctive benefits of, and need for, an interdisciplinary approach and convey their appreciation of the supplementary processes involved in interdisciplinary research, for example in terms of user engagement.

Where proposals are submitted from a team of researchers, an explicit strategy for building and managing the research team to best effect is crucial. Consideration may also need to be given to career mentoring and development for junior researchers within the team, given the challenges of developing an interdisciplinary, academic career.

What does a successful interdisciplinary proposal look like?

A checklist for reviewers

- Does the proposal specify clearly why an interdisciplinary approach is needed, which type of interdisciplinary approach is envisaged and which disciplines should be involved?
- Does it describe how the disciplines involved will be integrated (in the design and conduct of the research as well as in subsequent publications) and how this relates to the type of interdisciplinarity involved; does it demonstrate how the quality of integration will be assured?
- Is the leadership role and management strategy to deliver the desired outcomes clearly articulated?
- Do the researchers involved have demonstrable interdisciplinary skills and experience? In particular, is there evidence of interdisciplinary leadership?
- Is there an appropriate plan for stakeholder/user engagement from the outset of the project (this will usually be more of an issue for problem-focused interdisciplinary projects)?
- Does the proposal budget for, and justify, the additional resources needed?
- Is it clear how interdisciplinarity will be reflected in the project outputs and outcomes?

This note is based on the authors' experience gleaned from their participation in, and evaluation of, a broad range of interdisciplinary projects and programmes. For further information contact c.lyall@ed.ac.uk



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